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SEMITRACKS
MONTHLY
NEWSLETTER

INFOTRACKS

[this issue]

Course Highlights

Semitracks continues to expand its course offerings this year with new courses and new locations. We offer live seminars in Europe, North America, and Asia, and our online classes can be accessed anywhere in the world. For more information, click on the links below.

ASIA

Failure and Yield Analysis

June 2-5, 2009
Singapore/Malaysia

Semiconductor Reliability

June 8-11, 2009
Singapore/Malaysia

NORTH AMERICA

Optimizing Factory Performance

June 23-25, 2009
Albuquerque, NM

For a full list of courses offered, click here.

For more information about online courses, click here.

Does FA Change in a Recession?

By Chris Henderson

As any news channel will remind you, the world economy has been sliding deeper into recession as a result of easy credit conditions for the past 10 years. The economic downturn is likely to last for quite some time, with any recovery being modest at best. Since semiconductor content pervades nearly all aspects of the economy, the industry rises and falls in much the same way the world economy rises and falls. Our industry is currently laying off many thousands of people. Some of these people may be your friends; you may even be one of these people. Most of the economic forces are beyond our control. They are beyond the control of your management, and may even be beyond the control of your company's executive management. What's an analyst to do?

"During economic hardship… failures still occur and need to be addressed."

We can only control our own behavior and actions. Given that we might need to locate a new job at any time, we need to keep our education up to date and prepare ourselves to do failure analysis of any type. In this article, however, I would like to shift the focus on the recession's impacts on the FA process.

Although many companies tend to scrimp on FA during economic hardship, the reality is that failures still occur and need to be addressed. The FA operation still needs to provide a reasoned, scientific approach to solving problems. Analysts need to resist the urge to "solve problems on the cheap" by skipping steps and reducing data-gathering. Management is likely to put pressure on the FA lab to reduce costs by pumping out more analyses using fewer employees and fewer dollars. It is the job of the lab manager to press back and educate management in the problems associated with doing this. A rushed analysis is more prone to errors. Overworked, tired analysts also generate more errors. When I worked at Honeywell in the 1980s, we did a study to determine if overtime increased the output of the FA lab. The findings were interesting. Overtime increased the output for about two weeks, but after the initial two weeks, the output fell back to the original level. More interestingly, the number of

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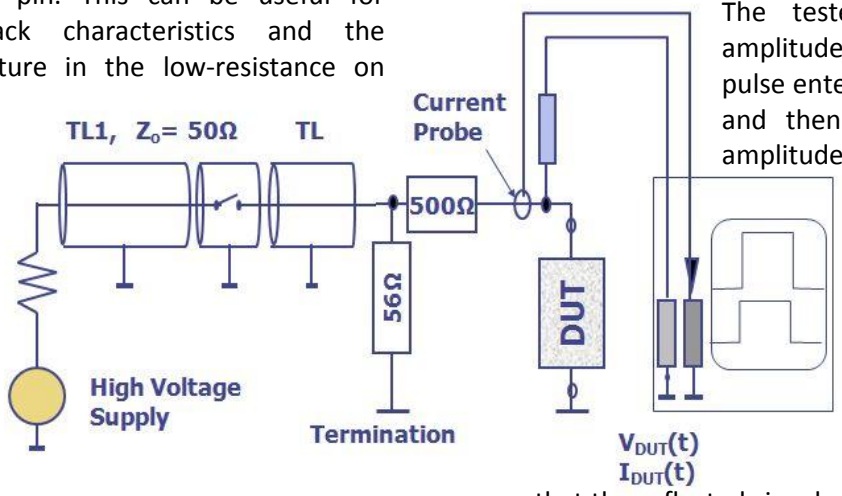
Technical Tidbit

Transmission Line Pulse Testing

This month's technical tidbit is on transmission line pulse (TLP) testing, an excellent method for characterizing a device's response to a fast ESD pulse. One can produce a current-voltage characteristic for an input or output pin. This can be useful for determining snapback characteristics and the behavior of a structure in the low-resistance on condition.



This diagram shows the basic elements of a transmission line pulse system. TLP testers use a 50-Ω coaxial cable to form and transmit the pulse. The length of the cable determines the length of the test pulse. Each meter of cable adds roughly 9 ns to the pulse. About 10m of cable is necessary in order to get a 100-ns pulse. A low-resistance relay connects the cable to the DUT through either a resistor, as shown in the diagram above, (referred to as the constant-current method) or an attenuator and low-pass filter (referred to as the constant-impedance method). To measure the voltage across and the current through the DUT during a TLP pulse, a TLP tester uses an oscilloscope with at least a 500-MHz bandwidth. A voltage probe connects between the device's test pin and ground. A current probe measures the current that enters the DUT.

While many TLP testers use constant-current and constant-impedance methods to calculate current, others use time-domain reflectometry. These testers use a delay line and an attenuator following the relay. The tester measures the amplitude of the current pulse entering the delay line, and then it measures the amplitude of the reflection from the DUT. From the difference in amplitude, the tester can calculate the current and voltage in the DUT. The delay line ensures that the reflected signal won't interfere with measurements on the incident signal.

Regardless of which method you use to calculate current, the TLP tester injects current into a MOS device's drain with the gate and source grounded. If the tester increases the pulse amplitude, failures will begin to occur when the end of the pulse reaches the DUT. By that time, the device will have had to withstand all of the pulse's total energy.

Recession Changes

[Continued from Page 1]

undiscovered and misidentified failures increased substantially. The analysts became tired and irritable, and their work quality suffered as a result. The cost of misidentification or no identification of a failure mechanism greatly exceeds the savings that result from cutting back in the FA lab.

With that said, we need to do our part to cut costs to help our companies survive. In many instances, we can manage by using less expensive tools, researching alternate techniques, taking advantage of commercial labs, and discussing the necessity of an analysis with the customer before starting it. The equipment, techniques, and people may change, but the philosophy and the process should not change. Does FA change in a recession? The answer is emphatically "No and Yes."

Questions & Answers

Q: I had a question about multiple contacts. Design software often allows for additional contacts if there is room. Is there any reason not to have multiple contacts? Also, is there any difference between Al and Cu? -Joey

A: Dear Joey: As with many things in the semiconductor industry, it depends. Usually, adding more contacts increases electromigration lifetime. However, the graph on the following page shows a situation where it doesn't. In some cases, you can

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What Our Customers Say:

"The time allotted [to the class] was very flexible, and the casual environment led directly to discussion."

"Very well tailored to our specific needs."

"The discussion of Solar Cell Physics provided the necessary background of the course…. The presentation length was just right. Well done!"

"Entertaining and informative. Very insightful."

For more information on Semitracks online training or public courses, visit our website! www.semitracks.com

Course Spotlight

Optimizing Factory Performance

Manufacturing is a crucial component of the foundation that maintains the security, health, and wealth of any country. One of the most important measures of manufacturing performance is cycle time—the time between the job's introduction into the factory and its completion. Over the past 50 years, numerous management and manufacturing fads have been proposed for the achievement of improved organization and factory performance. Almost all have failed to live up to their hype. Today, in fact, the principal performance measure of a factory—load-adjusted cycle-time efficiency—is identical or only marginally better than that of factories of a half-century ago. Consequently, enormous improvements are needed in almost any factory in any country.

One of Semitracks' newest courses, **Optimizing Factory Performance**, examines manufacturing's importance, history, and terminology. To cost-effectively improve factory performance, one must venture beyond the traditional first and second dimensions of manufacturing, which rely almost exclusively on physical changes to the factory or its components. Instead, the most effective approach to improved factory performance can be achieved through the third dimension of manufacturing—implementing changes to the strategies and tactics employed in factory operation.

Instructed by Dr. James Ignizio, Optimizing Factory Performance is a 3-day course designed for managers, engineers, or scientists within the manufacturing sector. The course provides detailed instruction on those methods that comprise the third dimension of manufacturing. Attendees will be able to experience the implementation of these methods by managing a simulated factory.

For a full course outline, instructor profile, and upcoming course dates and locations, follow the link below to www.semitracks.com.

Questions and Answers

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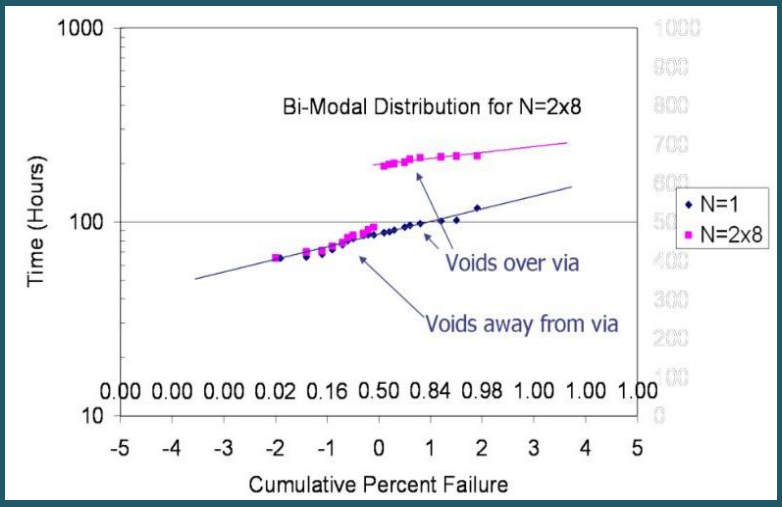
get a bimodal distribution. You still have early failures because the line, rather than the via, fails. This can be the case with both copper and aluminum. This is usually an issue when the shunt layer sheet resistance exceeds the via resistance. Hope that helps!



For more information or to post, read, or answer a question, visit http://forums.semitracks.com/

Customer Feedback

If you have a suggestion or a comment regarding our courses, online training, discussion forums, or reference materials, or if you wish to suggest a new course or location, please feel free to call us at 1-505-858-0454 or e-mail us at info@semitracks.com.

To submit questions about an article or suggest a topic you would like to see covered in July's newsletter, please contact Alicia Constant at alicia.constant@semitracks.com. We are always looking for ways to enhance our courses and educational materials.